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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/747,054	12/22/2000	Dov Bulka	40921/206279	1574

28372 7590 02/12/2003

KILPATRICK STOCKTON LLP
3737 GLENWOOD AVENUE
SUITE 400
RALEIGH, NC 27612

EXAMINER

MAHMOUDI, HASSAN

ART UNIT PAPER NUMBER

2175

DATE MAILED: 02/12/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/747,054

Applicant(s)

BULKA ET AL.

Examiner

Tony Mahmoudi

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.

- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.

- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DOV POPOVICI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

2. Claims 1-3 are rejected under 35 U.S.C. 102(e) as being anticipated by Vahalia et al (U.S. Patent No. 6,192,408.)

As to claim 1, Vahalia et al teaches a method of searching a file access system for a requested file (see Abstract, and see column 19, line 66 through column 20, line 17), comprising:

allocating memory for directory cache and buffer cache (see column 21, lines 36-45), the directory cache storing directory layouts (see column 21, lines 5-11, where "storing directory layouts" is read on "a filename in the directory of the cache");

searching the directory cache for a requested file (see column 19, line 66 through column 20, line 17); and

pointing to where the name of the requested file is stored (see column 18, lines 8-14, where "the name of the requested file" is read on "file ID".)

As to claim 2, Vahalia et al teaches the method further comprising conventionally searching file structures when the directory cache is not found (see column 29, lines 32-40, where “directory cache is not found” is read on “with the cached disk storage system omitted”.)

As to claim 3, Vahalia et al teaches wherein the step of allocating memory for directory cache includes selecting directories to cache using at least one of the number of files in a directory and the frequency of use (see column 7, lines 41-67.)

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 4-5, and 14-15 are rejected under 35 U.S.C. 102(b) as being anticipated by Saks et al (U.S. Patent No. 5,666,532.)

As to claim 4, Saks et al teaches a method of accessing files in a file access system (see Abstract, and see column 5, lines 2-6), comprising:

reading a directory into buffer cache, the directory having a storage device representation (see column 7, lines 38-46, and see column 9, lines 13-30, where “storage device representation” is read on “disk”);

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converting the directory from the storage device representation to a faster representation (see column 9, lines 13-30, where “faster representation” is read on “keeping file data and file system structural information in the page cache **41**, or the buffer cache **40**, or both the caches”), the faster representation representing a layout of the directory (see column 7, lines 41-45); and

searching the faster representation for a requested file (see column 8, lines 20-23);

wherein the storage device representation is maintained for backwards compatibility with pre-existing and older file access systems (it is inherent that files kept on disks, CDs, or other type of storage device representation are kept for the purpose of maintaining compatibility with pre-existing and older file access systems.)

As to claim 5, Saks et al teaches a method of accessing files in a file access system (see Abstract, and see column 5, lines 2-6), comprising:

reading a directory into buffer cache, the directory having a storage device representation (see column 7, lines 38-46, and see column 9, lines 13-30, where “storage device representation” is read on “disk”);

converting the directory to a faster representation, the faster representation (see column 9, lines 13-30, where “faster representation” is read on “keeping file data and file system structural information in the page cache **41**, or the buffer cache **40**, or both the caches”) including a pointer from a directory i-node to an associated hash table (see column 10, lines 54-56), the hash table containing a layout of the directory (see column 20, lines 60-64, and see figure 7); and

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searching the faster representation for a requested file (see column 8, lines 20-23);

wherein the storage device representation is maintained for backwards compatibility with pre-existing file access systems (it is inherent that files kept on disks, CDs, or other type of storage device representation are kept for the purpose of maintaining compatibility with pre-existing file access systems.)

As to claim 14, Saks et al teaches a computer server system (see column 30, lines 30-41), comprising:

an outer cabinet housing memory, an array of storage devices, at least one power supply providing electrical power to the computer server system (see computer system 3 of figure 19. It is inherent that a “server system” has “an outer cabinet housing memory, an array of storage devices, at least one power supply providing electrical power to the computer server system”, and

at least one processor (see column 30, lines 33-34.)

For the remaining steps of claim 14, applicant is directed to the remarks and discussions made in claim 5 above.

As to claim 15, Saks et al teaches a network storage system (see column 6, line 65 through column 7, line 7, and see column 30, line 29, where “network storage system” is read on “network file system”, and see figure 19), comprising:

an outer cabinet housing memory, an array of storage devices, at least one power supply providing electrical power to the network storage system (see column 30, lines 52-56. It is

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inherent that a “network storage system” has “an outer cabinet housing memory, an array of storage devices, at least one power supply providing electrical power to the network storage system”), and

at least one processor (see column 30, lines 33-34.)

For the remaining steps of claim 14, applicant is directed to the remarks and discussions made in claim 5 above.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 6-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saks et al (U.S. patent No. 5,666,532), as applied to claims 4-5 above, in view of Ish et al (U.S. patent No. 5,778,430.)

As to claim 6, Saks et al does not teach the method further comprising hashing selected directories into a hash table format.

Ish et al teaches a method and apparatus for computer disk cache management (see Abstract), in which he teaches hashing selected directories into a hash table format (see column 5, lines 41-44.)

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Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Saks et al to include hashing selected directories into a hash table format.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Saks et al by the teaching of Ish et al, because hashing selected directories into a hash table format, would make the management of hashed data blocks easier and more efficient.

As to claim 7, Saks et al does not teach the method further comprising hashing selected directories into a hash table format according to a size of the directory.

Ish et al teaches a method and apparatus for computer disk cache management (see Abstract), in which he teaches hashing selected directories into a hash table format (see column 5, lines 41-44) according to a size of the directory (see column 5, lines 61-65.)

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Saks et al to include hashing selected directories into a hash table format according to a size of the directory.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Saks et al by the teaching of Ish et al, because hashing selected directories into a hash table format according to a size of the directory, would tailor the management of hashed data blocks to accommodate directories with different sized of data.

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As to claim 8, Saks et al does not teach the method further comprising hashing selected directories into a hash table format according to frequency of access.

Ish et al teaches a method and apparatus for computer disk cache management (see Abstract), in which he teaches hashing selected directories into a hash table format (see column 5, lines 41-44) according to frequency of access (see column 6, lines 7-13.)

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Saks et al to include hashing selected directories into a hash table format according to frequency of access.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Saks et al by the teaching of Ish et al, because hashing selected directories into a hash table format according to frequency of access, would tailor the management of hashed data blocks to accommodate directories based on how frequently they are accessed.

As to claim 9, Saks et al does not teach the method further comprising hashing selected directories into a hash table format according to a user selected criteria.

Ish et al teaches a method and apparatus for computer disk cache management (see Abstract), in which he teaches hashing selected directories into a hash table format (see column 5, lines 41-44) according to a user selected criteria (see column 5, lines 37-40, and see column 8, lines 28-37.)

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Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Saks et al to include hashing selected directories into a hash table format according to a user selected criteria.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Saks et al by the teaching of Ish et al, because hashing selected directories into a hash table format according to a user selected criteria, would tailor the management of hashed data blocks to accommodate directories based on a pre-defined set of parameters submitted by the user.

As to claim 10, Saks et al teaches a method of searching a file access system for a requested file (see column 8, lines 20-23), comprising:

establishing a pointer for the directory, the pointer pointing from a directory i-node (see column 10, lines 54-56) to the hash table (see column 10, lines 54-56.)

Saks et al does not teach:

allocating a hash table, the hash table having hash buckets;

hashing a directory into the hash table; and

searching the hash buckets for a requested file.

Ish et al teaches a method and apparatus for computer disk cache management (see Abstract), in which he teaches: allocating a hash table, the hash table having hash buckets (see column 5, line 66 through column 6, line 6); hashing a directory into the hash table (see column 5, lines 43-50); and searching the hash buckets for a requested file (see column 3, lines 53-63.)

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Saks et al to include allocating a hash table, the hash table having hash buckets; hashing a directory into the hash table; and searching the hash buckets for a requested file.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Saks et al by the teachings of Ish et al, because allocating a hash table, the hash table having hash buckets; hashing a directory into the hash table; and searching the hash buckets for a requested file, would increase the speed of managing (indexing, retrieval) of cached data within different directories.

As to claim 11, Saks et al as modified teaches wherein the step of hashing a directory includes hashing selected directories into a hash table format (see Ish et al, column 5, lines 41-44) according to a size of the directory (see Ish et al, column 5, lines 61-65.)

As to claim 12, Saks et al as modified teaches wherein the step of hashing a directory includes hashing selected directories into a hash table format (see Ish et al, column 5, lines 41-44) according to frequency of access (see Ish et al, column 6, lines 7-13.)

As to claim 13, Saks et al as modified teaches the method further comprising linking hash buckets to offsets where a name of the requested file is stored (see Ish et al, column 3, lines 47-53.)

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following patents are cited to further show the state of art with respect to searching and retrieval of files from file access systems and directories, and performing Hash functions on directory contents in general.

U.S. Patent No. 6,453,319 to Mattis et al.

U.S. Patent No. 6,314,437 to Starek et al.

U.S. Patent No. 5,151,989 to Johnson et al.

8. Any inquiries concerning this communication or earlier communications from the examiner should be directed to Tony Mahmoudi whose telephone number is (703) 305-4887. The examiner can normally be reached on Mondays-Fridays from 08:00 am to 04:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dov Popovici, can be reached at (703) 305-3830.

tm

January 27, 2003


DOV POPOVICI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100